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These solutions are not the only "perfect" or "10/10" solutions to be followed as a model. They are examples of ways to solve these problems. There are many many alternative ways to solve these problems. We hope that these example solutions help you check your work.

Problems

Q1. Prove the following facts about the identity transformation $I : V \to V$.

(a) If $S : U \to V$ is linear then $IS = S$.

Solution: Given $\mathbf{u} \in U$, we have that $IS(\mathbf{u}) = I(S(\mathbf{u})) = S(\mathbf{u})$, so $IS = S$.

(b) If $T : V \to W$ is linear then $TI = T$.

Solution: Given $\mathbf{v} \in V$, we have that $TI(\mathbf{v}) = T(I(\mathbf{v})) = T(\mathbf{v})$, so $TI = T$.

And finally, check carefully whether the compositions SI and IT are defined.